

Amendments to the Claims:

Please cancel claims 1-20 as presented in the underlying International Application No. PCT/EP2005/051335.

Please add new claims 21-41 as indicated in the listing of claims below.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-20 (canceled)

Claim 21 (new): A method for operating an electromagnetic operating mechanism including a magnet yoke, a permanent magnet, an armature, and electromagnetic coil device, a control circuit including a microcontroller, the electromagnetic operating mechanism having:

a permanent-magnet assisted electromagnetic pull-in mode provided against a retaining force upon application of a control voltage to the control circuit;

a subsequent, permanent-magnetic holding mode provided while the control voltage remains applied; and

a drop-out mode provided electromagnetically against the permanent-magnetic holding force and assisted by the retaining force, a capacitive charge storage device charged during the pull-in and holding modes being discharged upon removal of the control voltage so as to cause the drop-out mode;

the method comprising the following steps:

A) upon application of the control voltage, resetting and initializing the control circuit and starting a charging of the charge storage device;

B) subsequently sequentially briefly energizing an auxiliary tripping coil and a main tripping coil, and, if no current flow occurs through at least one of the auxiliary and main tripping coils, permanently disconnecting the control voltage;

C) if a current flow occurs through each of the tripping coils, energizing a closing coil so as to move the armature to an attracted position, and subsequently de-energizing the closing coil;

D) subsequently sequentially briefly energizing the auxiliary tripping coil and the main tripping coil without affecting the armature, and

if no current flow occurs through the auxiliary tripping coil, discharging the charge storage device through the main tripping coil so as to move the armature to a dropped-out position,

if no current flow occurs through the main tripping coil, energizing the auxiliary tripping coil so as to move the armature to the dropped-out position,
and then permanently disconnecting the control voltage;

E) if a current flow occurs through each of the tripping coils, re-starting step D; and

F) upon removal of the control voltage, discharging the charge storage device through the main tripping coil so as to move the armature to the dropped-out position.

Claim 22 (new): The method as recited in claim 21 further comprising checking, prior to the briefly energizing the main tripping coil as recited in step B, a charge state of the charge storage device.

Claim 23 (new): The method as recited in claim 21 wherein the permanent disconnecting of the control voltage as recited in steps B and D is performed using a short-circuit tripping.

Claim 24 (new): The method as recited in claim 21 wherein the current flow through the auxiliary tripping coil as recited in steps C and E is detected as a resistive voltage drop.

Claim 25 (new): The method as recited in claim 21 wherein the current flow through the main tripping coil as recited in steps C and E is detected as a voltage drop across the charge storage device.

Claim 26 (new): The method as recited in claim 25 further comprising, when the voltage drop across the charge storage device is too low or too high, energizing the auxiliary tripping coil prior to the permanently disconnecting the control voltage.

Claim 27 (new): The method as recited in claim 21 further comprising, when a voltage rise induced on the closing coil as a result of the current flow through either of the main and auxiliary tripping coils fails to occur, energizing the respective other tripping coil as necessary to move the armature to the dropped-out position, and permanently disconnecting the control voltage.

Claim 28 (new): The method as recited in claim 21 further comprising, in an event of a failure of the microcontroller, discharging the charge storage device through the main tripping coil so as to move the armature to the dropped-out position.

Claim 29 (new): The method as recited in claim 21 further comprising, in an event of a failure of the microcontroller, energizing the auxiliary tripping coil so as to move the armature to the dropped-out position.

Claim 30 (new): The method as recited in claim 21 wherein the retaining force is provided by at least one return spring operatively connected to the armature.

Claim 31 (new): The method as recited in claim 21 wherein the retaining force is provided by at least one further permanent magnet operatively connected to the armature.

Claim 32 (new): The method as recited in claim 21 wherein further comprising checking, prior to the briefly energizing the main tripping coil as recited in step B, a charge state of the charge storage device.

Claim 33 (new): A circuit arrangement for operating an electromagnetic operating mechanism including a magnet yoke, at least one permanent magnet disposed at a side of the magnet yoke, an

armature, a retaining device configured to exert a retaining force, and an electromagnetic coil device surrounding the magnet yoke, wherein, upon application of a control voltage, the armature is configured to be attracted against the retaining force, assisted by permanent-magnet action, then to be held by permanent-magnet action while the control voltage remains applied, and when the control voltage is removed, the armature is configured to drop out with assistance of the retaining force and against the permanent-magnet holding force, the circuit arrangement comprising:

- a capacitive charge storage device configured to discharge so as to permit the armature to drop out; and

- a control circuit configured to be supplied with a rectified control voltage applied to its input and including a microcontroller, the control circuit including:

 - a trippable permanent interrupting element configured to permanently disconnect the control voltage, the control voltage being supplied via feed terminals;

 - an auxiliary disabling branch connected to the feed terminals and including a series connection of an auxiliary tripping coil, an auxiliary disabling element, and a current-sensing device;

 - an enabling branch connected downstream of the permanent interrupting element and including a series connection of a closing coil and an enabling element;

 - a main disabling branch connected downstream of the permanent interrupting element and including a series connection of a forward-biased decoupling diode, a main tripping coil and a main disabling element, the charge storage device being connected in parallel with the main tripping coil and the main disabling element; and

 - a voltage-sensing device connected in parallel with the charge storage device;

wherein:

- a plurality of first connections connect an input side of the microcontroller to the current-sensing device, the voltage-sensing device, and to a control voltage controller, an input side of the control voltage controller being connected to the feed terminals;

- a plurality of second connections connect an output side of the microcontroller to the auxiliary disabling element, the enabling element and the main disabling element and to the permanent interrupting element;

the microcontroller is programmed so as to:

- be initialized upon application of the control voltage;
- be briefly close the auxiliary and main disabling elements in a predeterminable order without affecting the armature;
- activate the enabling element in a pulse-controlled manner so as to move the armature to an attracted position;
- subsequently deactivate the enabling element;
- when the control voltage is removed, close the main disabling element so as to move the armature to a dropped-out position;
- if a respective output signal of the current-sensing device or of the voltage-sensing device fails to appear, immediately close at least one of the main and auxiliary disabling element so as to move the armature to the dropped-out position, and subsequently trip the permanent interrupting element.

Claim 34 (new): The circuit arrangement as recited in claim 33 wherein the permanent interrupting element includes a short-circuit protective device and a downstream short-circuit switching element, the short-circuit protective device being connected to one of the feed terminals.

Claim 35 (new): The circuit arrangement as recited in claim 34 further comprising a charging capacitor configured to discharge or charge when the enabling element is blocked or open, respectively, and an active low-pass filter connected on an input side thereof to the closing coil and on an output side thereof to the short-circuit switching element so that the charging capacitor closes the short-circuit switching element when a predetermined charge voltage is reached.

Claim 36 (new): The circuit arrangement as recited in claim 33 wherein the current-sensing device includes a current-sensing resistor and a first amplifier circuit originating at the current-sensing resistor.

Claim 37 (new): The circuit arrangement as recited in claim 33 wherein the voltage-sensing

device includes a high-pass filter connected to the charge storage device, and a second amplifier circuit, the second amplifier circuit originating at the high-pass filter and being connected to the microcontroller.

Claim 38 (new): The circuit arrangement as recited in claim 37 wherein the voltage-sensing device include a third amplifier circuit, the third amplifier circuit originating at the charge storage device and being connected to the microcontroller.

Claim 39 (new): The circuit arrangement as recited in claim 33 further comprising an activatable free-wheeling circuit and a further voltage-sensing device connected to the closing coil and configured to detect a voltage rise induced during a brief closing of at least one of the main tripping coil and the auxiliary tripping coil and to provide the voltage rise to the microcontroller, and wherein, if the voltage rise fails to occur, the microcontroller is configured to close at least one of the auxiliary disabling element and the main disabling element so as to move the armature to the dropped-out position and then trip the permanent interrupting element.

Claim 40 (new): The circuit arrangement as recited in claim 33 wherein the retaining device includes at least one return spring operatively connected to the armature.

Claim 41 (new): The circuit arrangement as recited in claim 33 wherein the retaining device includes at least one further permanent magnet operatively connected to the armature.